Introduction

In a rapidly evolving technological landscape, teachers are constantly adapting to ever-changing definitions of what literacy is and looks like in the classroom. Responding to “what’s next” in education, we argue that to provide our students with the skills necessary to be successful twenty-first-century citizens, we must reimagine what it means to be “literate” and respond by providing our students not only with opportunities to read in multiple media, but also to produce across those media.

While we have seen a shift in the types of texts teachers are selecting for students to read (including video, websites, and informational texts), what is now needed is a shift in the way we teach students to communicate. Students are no longer merely consumers of information media, but are increasingly the producers of it, managing multiple social media accounts and YouTube channels, and designing websites, video games, and mobile apps. The National Council of Teachers of English (NCTE) describes twenty-first-century literacies as “multiple, dynamic, and malleable” and highlights the ability to “design and share information” and “create multimedia texts” (NCTE, 2013). We want to emphasize this importance of producing—moving beyond the heavy reliance on typographic writing—and asking students to synthesize and create arguments across a variety of media.

Middle school students have graduated from self-contained elementary school classrooms to siloed, content-driven classrooms, yet outside of school they are bombarded by information, often in multiple media and brief snippets. English teachers can be change agents in de-siloing learning; in the same way that reading and writing belong in every content area, the creation of images, multimedia, data visualization, and social media content have a place in the ELA classroom. The Common Core State Standards support this; the English Language Arts (ELA) Writing Standards and Anchor Standards for Reading highlight the need for supporting literacy with newer media: students should include “graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension” (W.7.2.A), “use technology, including the Internet, to produce and publish writing” (W.7.6), write “for a range of discipline-specific tasks, purposes, and audiences” (W.7.10), and “integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words” (CCRA.R.7) (NGA & CCSO, 2010). Teachers of literacy need to be more deliberate in teaching students to not just be able to read “content presented in diverse media and formats,” but to use those media and formats to produce content.

It is less important that students gain the technical skills specific to a particular technology, as these are constantly shifting—technologies students learn in seventh grade are likely to be significantly evolved or obsolete in a few years. What is important is that students learn to produce varied content across a variety of technological domains. In this article, we discuss three emerging literacies, placing them in the context of the ELA classroom, and provide sample performance tasks which can meet the CCSS standards highlighted while attending to the production attribute of each literacy.

1. We have chosen CCSS ELA standards for Grade 7 for consistency throughout the document.
Visual Literacy

Metros (2008) defines visual literacy as “the ability to decode and interpret (make meaning from) visual messages and also to be able to encode and compose meaningful visual communication” (p. 102). With the proliferation of devices that make not only taking but sharing photographs and videos so simple that 1.8 billion photographs are shared per day on social media (Meeker, 2014, p. 62), the need to attend to visual literacy is becoming as significant as attention to typographic literacy.

Middle school marks a particularly critical moment for visual literacy instruction. Young adolescents receive their own smartphone, on average, at age 10, and nearly 50 percent of all middle schoolers will have a social media account by eighth grade (Donovan, 2016). With access to these technologies begins “the rise of a new visual vocabulary. Photos, along with emojis, video snippets, GIFs, and other imagery, are replacing written language for many of the things we once relied on words to express” (Hempel, 2014). Without the thoughtful integration of visual literacy in our classrooms, students will be left to navigate an onslaught of visual content without first becoming literate in it. Further, with their smartphones, they become not only viewers, but producers and publishers of images. It is therefore important that students, so well versed in the proliferation of images, also experience lessons that provide guided discourse across their associated sharing platforms.

Performance Task for Visual Literacy

Thematic photo essay

Prior to reading Thanhha Lai’s Inside Out & Back Again, students are tasked with taking a photograph that represents a family tradition in order to connect with the text’s theme of cultural and family traditions. Students post their photographs in Padlet, an online bulletin-boarding tool. Students then view and comment on their peers’ work, much in the same way they would in various social media outlets, but in Padlet’s private space that can be viewed only with access to the project’s unique URL. Teachers can use Artful Thinking (Palmer & Tishman, 2006) strategies developed by Harvard’s Project Zero to help students gain skills in critical viewing which will help them better discuss the images within the context of the text-related themes. (Figure 1).

Numeracy

The term numeracy has begun to creep into ELA teachers’ lexicons, but it is not yet addressed in common Content Area Reading texts. Much as a math teacher might ask, “Why should I use reading strategies in my math class?” an ELA teacher might question being asked to teach numerical literacy. Numeracy is an “appreciation of common numerical sense with a depth of reasoning and critical thinking around how numbers change our world” (Pearse & Walton, 2011, p. 2 & p. 4) or, simply, “the ability to use mathematics in everyday life” (National Numeracy, n.d.). We emphasize that twenty-first-century literacy must ask students to show evidence of numeracy by using numbers to produce arguments—we must teach students to wield data to construct an argument, not just to prove an understanding of numbers in a reading.

Numeracy is alluded to in the CCSS Writing Standards, where students are asked to include “graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension” (W.6.2.A), and write “for a range of discipline-specific tasks, purposes, and audiences” (W.6.10) (NGA & CCSSO, 2010). However, asking students to “include graphics” is not enough; we need to teach students to synthesize ideas from a variety of sources across media and produce their own quantitative arguments to strengthen language-based arguments. We need to go beyond including a brief chart or graph to summarize data in a text—although that is important—and teach students to actively seek out quantitative supports and craft clear, purposeful

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Students develop quantitative reasoning and critical thinking by analyzing descriptions of tables for content, language, and organization with a particular focus on verb tense selection, and then writing descriptions of tables themselves.

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numerical representations to support their own authentic arguments.

**Performance Task for Numeracy: Infographic**

After reading *Hoot* by Carl Hiaasen, students research a contemporary issue of interest then craft a one-page infographic on their important topic. Synthesizing data from teacher-selected sources (e.g., National Geographic for Kids, the World Wildlife Federation, http://kids.nationalgeographic.com/explore/nature/hooray-for-siberian-tigers/, https://www.worldwildlife.org/species/tiger) and from responses from student-generated survey questions, students develop a clear thesis, which they support with a series of visual and numerical representations of the data they have collected. Although images and words are important in an infographic, contextualizing the story behind the data should be the primary focus for the students and for the readers. Students can create print infographics using word processing programs, such as Microsoft Word, or online tools, such as Piktochart or Easel.ly, that can be published to a school website or social media page. Students can also present their infographics in an oral presentation using the presentation features built into Piktochart. (Figure 2).

**Emerging Realities, Emerging Literacies**

As new technologies emerge, publishers are seeking ways to connect viewers between the page and the screen. This is why in 2015 *The New York Times* sent its Sunday paper subscribers a Google Cardboard viewer to view virtual reality (VR) content accompanying print articles—and made the content available without special equipment in digital subscriptions (Wang, 2015). Meanwhile, multiple print media are using augmented reality (AR) to enhance readers’ experience and understanding by allowing readers to access additional content by scanning printed pages with smartphone apps. For example, filmmaker and artist Ram Devineni introduced his groundbreaking AR-enhanced graphic novels *Priya’s Shakti* and *Priya’s Mirror* as a response to rape culture in India. The books
allow readers to access anti-sexual violence media by scanning the pages with an app (Petronzio, 2015); the books are now being implemented in school curricula in Delhi (Dupere, 2016).

Augmented and virtual reality are the most recent technologies to change the ways in which a reader must be literate. It is easy to make the case for including opportunities for students to experience reading these technologies; again, we stress the importance of producing within the media. While this may seem a daunting proposition, there are creation platforms that make AR and VR surprisingly easy to create and share for middle school classrooms.

**Performance Tasks for New Realities**

**Augmented reality**

In conjunction with *The Wednesday Wars* by Gary Schmidt, a class completes a research-based AR bulletin board. Each student is given a topic to research and uses the web application HP Reveal (www.hpreveal.com) to create an *aura*—content that appears around a trigger image when scanned with the HP Reveal app—to teach their topic; this can include video, images, web links, or text. After creating the auras, students’ trigger images are printed and posted on a bulletin board, and readers then use the HP Reveal app to scan images and read each AR report. (Teachers can create a class account to monitor the auras students can access). (Figure 3).

**Virtual reality**

After writing an informational text about wildlife in a specific ecosystem, students create a VR experience using Co-Spaces (www.cospaces.io). Students search for public domain 360-degree photographs of the ecosystem (consider www.wpanorama.com) and upload them into the Co-Spaces interface. Students then add images of wildlife using search features or upload from a teacher-curated folder of images (PNG format images with clear backgrounds work best), add clickable captions

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**Figure 2.** A sample infographic created with Piktochart. View online at https://magic.piktochart.com/output/23591931-endangered-tigers

**Figure 3.** Example of augmented poster. In order to view the augmented reality story (right), readers download and open the free HP Reveal app, follow ProfCouni, and scan the trigger image (left). Readers then select an image, which will take them to videos, articles, images, and a virtual reality tour to tell a story of the Vietnam War protests around the country. (See References for sources used to create this aura).
to the images using the easy coding tools provided, and add a soundtrack to make the VR experience more immersive. Finally, students view their peers’ VR creations in the Co-Spaces app with a low-cost VR viewer like Google Cardboard or without a viewer on any web-enabled device. (Figure 4).

Conclusion

The shift in the way information is presented and consumed in the twenty-first century necessitates a shift in our definition of literacy—literacy must include students producing content across varied domains. To best prepare literate citizen leaders, ELA teachers must adapt and continue to engage students who learn differently and whose texts come in a variety of new formats; we need to recognize the importance of new literacies—inside and outside the classroom—and create lessons that go beyond the written and spoken word. A failure to do so leaves students behind their peers who have opportunities to communicate through multiple technological formats.


Learning and innovation skills increasingly are being recognized as the skills that separate students who are prepared for increasingly complex life and work environments . . . and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.

Beyond reading information in a variety of media, students must also be able to communicate by producing across media. “To be effective in the 21st century, citizens...

Figure 4. VR content created in Co-Spaces can include images, sound and clickable captions. View this example on a computer by going to https://cospac.es/UDG2 or by scanning the QR code and launching the scene in the free Co-Spaces app.
must be able to create, evaluate, and effectively utilize information, media, and technology” (p. 21, 2007). Synthesizing and organizing information across media asks students to use higher-order thinking, to evaluate sources, and to be literate (both as consumers and producers) across media; adding to traditional literacy skills a command of images, numbers, and emerging technologies will help students become truly literate citizens of the twenty-first century.

**References**

Donovan, J. (2016, May 19). The average age for a child getting their first smartphone is now 10.3 years. *TechCrunch*. Retrieved from https://techcrunch.com/2016/05/19/the-average-age-for-a-child-getting-their-first-smartphone-is-now-10-3-years/


**Augmented Reality Resources**


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